ATLAS TILE Calorimeter
TDAQinterface

Jul 7, 2016

http://

University of Texas at Arlington

Project manager	
Project dates	Oct 3, 2016 - Jan 7, 2026
Completion	0%
Tasks	70
Resources	1

Tasks

Name	Begin date	End date	Duration	Material	Travel
Conceptual TDAQi demonstration	10/3/16	9/29/17	260		
This first R&D phase will provide evaluation of feasibility for some critical functions using commercial solutions like FPGA evaluation boards where some of the functionalities can be emulated. is needed to: - acquire expertise on the use of components and on the programming of them. Also - acquire some of the HW that will be later used in test bench					
Draft of the System Requirements	10/3/16	11/11/16	30	No	No
Start outlining in an open document the requirements for the TDAQi system. The Interfaces with L0 and possible L1 trigger components. Definition of the data contents and format Trigger primitives: Cells, Towers, clusters. Latency and rates, Interfaces with FELIX: Data scheme, rates, Data format. Number of links required, possible speed and protocols.					
Design of test setup	11/14/16	12/9/16	20	No	No
draft of the demonstrator setup scheme. choice of the components: FPGA evaluation boards. Optical Link mezzanines.					
Hardware selection and procurement	12/12/16	12/30/16	15	Yes	No
Complete the hardware selection, contact vendors, request quotes, orde the material. A 30 day delay is considered as delivery time					
Demonstrator Setup	2/13/17	3/31/17	35	No	No
Build the Test Setup, install the needed sofware components start comunication test. Start preparing sw tools to test basic functionality.					
PPR Link firmware	4/3/17	5/12/17	30	No	No
Implementation of the Links from the PPR PU system. TTC signal Caracterization of Link stability, eye diagram.					
Trigger Link firmware	5/15/17	8/4/17	60	No	No
Implementation of the firmware to controll the links to the trigger components: Hadronic Calo, EM Calo, Muons					
Trigger primitives firmware	6/26/17	8/4/17	30	No	No
computaion of primitive for the Trigger system: Towers, or some other clustering for the Jet trigger. First layer cells for the e/gamma trigger. Last layer cells for the Muon trigger.					

Tasks

Name	Begin date	End date	Duration	Material	Travel
System Test	8/7/17	9/29/17	40	No	No
Integratipn and test of the different components: *deserialization of input data from PPR emulator or prototype link.* *preparation of trigger primitives or passtrough data.* *Routing of data to/from FELIX emulator, TTC info.* *Routing of data to the trigger systems optical link* *Caracterization of Link stability, eye diagram.* *measurement of Latency*					
Qualification	10/2/17	10/2/17	0	No	No
Knowledge on components and programing is adeguate. *The latency to the trigger path is withing the specification or in reach*					
TDAQi RTM Demonstrator Board	10/2/17	12/21/18	320		
Design, construction and testing of the smallest scaling of the Rear Transition Module board. (ATCA standard) *This will be interfaced with the PrePRocessor prototype v.1 as hosted in a comercial ATCA carrier and be able to process the data from a single Tile Module.*					
RTM high level design	10/2/17	11/10/17	30	No	No
high level design of the RTM within the ATCA standard,					
Schematics	11/13/17	2/2/18	60	No	No
PCB Layout design	2/5/18	4/27/18	60	No	No
Component selection and procurement	4/30/18	5/18/18	15	Yes	No
Component selection, *bill of material ready,* *quotes and purchasing.* *procurement time and other delay in the delivery are not included but considered as a 30 d delay before the start of the sucessor task*					
Signal integrity Simulation	4/30/18	6/22/18	40	No	No
simulation of the layout PCB					
Internal Design Revision	6/25/18	7/6/18	10	No	Yes
5d: meeting at CERN or in one other hosting lab for an Informal revision of the schematics and of layout by other EE colleagues on the PPR and Tile upgrade project. *+5 d for follow up and modifications*					
Production of RTM Demonstrator	7/9/18	8/17/18	30	Yes	No
Production of PCB and testing (10d), Mounting of components (20 d) Operations done by external vendors					
First RTM Demo built	8/20/18	8/20/18	0	No	No
the first RTM Demostration board have been buid					

Tasks

Name	Begin date	End date	Duration	Material	Travel
Firmware revision	8/7/18	11/26/18	80	No	No
Firmware preparation for the RTM board main FPGA: *tuning and optimisation of existing Fw and new* *Link with PPR/PU (deserialization)* *firware for local simplex IC needed* *for monitoring the status of the all the Optical links on the board and other basic functionality*					
RTM Demonstrator testing	8/20/18	10/19/18	45	Yes	No
Testing of the Demonstrator board: *sinple test of main functionality* *start the integration into the ATCA control*					
Integration Test @ CERN	10/22/18	11/30/18	30	Yes	Yes
15d: preparation at UTA *15d: at CERN, continue Integration in the ATCA system* *testing with the PPR PU in the ATCA carrier* *communication between the front and rear boards* *link BER and eyes diagram* *integration with FELIX emulator* *Integration with L0/L1 trigger system* *latency measurements*					
Revision/production of second version	10/22/18	11/30/18	30	Yes	No
revision of the prototype and results *production of a second version if needed*					
Qualification	12/3/18	12/3/18	0	No	No
The RTM demonstrator work or mostly work *some functionalities might be compromised but the issues are well understood or this is not crital for the scaling up of the board.*					
Documentation	12/3/18	12/21/18	15	No	No
Updates of open document					
TDAQi Prototype	12/24/18	3/6/20	315		
RTM board with the full functionality *capable to read out one PPR shelf with 8 TileCal modules and route the Trigger info and data through FELIX.*					
Schematics	12/24/18	2/1/19	30	No	No
PCB Layout design	2/4/19	5/10/19	70	No	No
Similar time (+10 d only) is assumed for the routing of the layout *despite the complexity might increased a factor 4 (or 8).* *Considering more familiarity and similarity to the previous phase.*					

Tasks

Name	Begin date	End date	Duration	Material	Travel
Component selection and Procurement	5/13/19	6/21/19	30	Yes	No
Component selection, bill of material ready, quotes and purchasing +15 days are added respect to to simialr task in the RTM Demo in case some of the components need to be replaced due resourses not sufficient e/o other issues and new component need to be evaluated. 30 d delay for procurement delivery is considered as a delay to start the successor task					
Signal integrity Simulation	5/13/19	7/5/19	40	No	No
Internal Design Revision	7/8/19	7/19/19	10	No	Yes
5d: meeting at CERN or in one other hosting lab for an Informal revision of the schematics and of layout by other EE colleagues on the PPR and Tile upgrade project. +5 d for follows up and posibles modification					
Production of TDAQi Prototype	8/5/19	9/13/19	30	Yes	No
Production of PCB and testing (10d), Mounting of components (20 d)					
Firmware tuning and optimisation	9/16/19	11/8/19	40	No	No
First Module Produced	11/11/19	11/11/19	0		
Testing of the module	11/11/19	12/20/19	30	Yes	No
Testing of the prototype, finalization of the test setup					
Software	11/11/19	1/31/20	60	No	No
software for the comunication and test of the Module in the test setup					
Production of V2 Prototype	12/23/19	1/31/20	30	Yes	No
If needed. production of PCB and testing (10d), Mounting of components (20 d)					
Integration Test @ CERN	2/3/20	2/21/20	15	No	Yes
at CERN, Integration in the ATCA system testing with more than one PPR PU (4?) in the ATCA PPR carrier communication between the front and rear boards link BER and eyes diagram integration with FELIX or Felix emulator Integration with L0/L1 trigger system interface latency measurements					
Documentation	2/24/20	3/6/20	10	No	No
update of the open document and finalization of it. Specs should be frozen by now					
Integration achived	2/24/20	2/24/20	0		
MRECF START	4/1/20	4/1/20	0		

Tasks

Name	Begin date	End date	Duration	Material	Travel
TDAQi Final Design	4/6/20	7/31/20	85		
This is the final iteration in the design. The system Requirements should be frozen by all meean. any possible loose end under our control are cutted. Small modification and fixes are assumed respect to the prototype.					
Revision of prototype	4/6/20	4/24/20	15	No	Yes
Revision If needed might require travel to CERN or other host Lab (5 d) plus time for preparation a/o follow up.					
Schematics	4/27/20	5/15/20	15	No	No
update on schematics if needed					
Component selection and Procurements	5/18/20	6/5/20	15	Yes	No
Revision or updates in components list and quotes and list of vendors if not satisfactory so far.					
Purchasing for preproduction					
PCB design and simulation	6/8/20	7/17/20	30	No	No
possible Revision in the layout and simulation					
Final Design Review @ CERN	7/20/20	7/31/20	10	No	Yes
FDR 5d travel +5 d follows up					
CERN FDR	8/3/20	8/3/20	0		
TDAQi preproduction	8/3/20	8/20/21	275		
TDAQi Pre-Production: 6.5.2.4.2 production of 4 RTM, finalisation of test stand for the qualification of the modules					
Production	8/3/20	9/11/20	30	Yes	No
Fabrication of PCB and Mounting of components fro 4 units					
Qualification	9/14/20	10/23/20	30	No	No
simple tests of the Modules					
Firmware design, testing, fixing,	10/26/20	12/4/20	30	No	No
Design of test stand	12/7/20	2/26/21	60	No	Yes
Test Stand for the RTM boards full testing and qualification. This is an ATCA system. Travel of EE to the Collaborating institute might be neccesary					

Tasks

Name	Begin date	End date	Duration	Material	Travel
Construction of test stand	3/1/21	5/21/21	60	Yes	No
Some of the equipment/components used previously only in the integration at CERN might be needed.					
Development of Control and Module Test	5/24/21	7/30/21	50	No	No
Development of Control and DAQ SW for the Test stand. *Tuning and revision of existing components* *Test of the 4 units.*					
Production Readiness Review	8/2/21	8/20/21	15	No	Yes
RPRR at CERN +Preparation					
CERN PRR	8/23/21	8/23/21	0		
TDAQi production	8/23/21	7/19/22	237		
Fabrication of PCB	8/23/21	10/1/21	30	Yes	No
32 units					
Mounting of components	10/4/21	11/12/21	30	Yes	No
32 units					
Burn in, Acceptance Testing,	11/15/21	4/1/22	100	No	No
some preliminare estimation of possible protocols for testing require ~1 week for the full validation of a board. *we would like to test 2 in parallel*					
Repairs of faulty units	4/4/22	6/24/22	60	No	No
repairs for 3/4 units					
Firmware finalisation	11/15/21	1/21/22	50	No	Yes
Shipment to CERN	6/27/22	7/8/22	10	Yes	No
shipment TBD, *probably in batches of 5 units.*					
Integration test at CERN	7/11/22	7/19/22	7	Yes	No
Acceptance at CERN	7/20/22	7/20/22	0		
TDAQi installation	9/2/24	4/25/25	170		
commissioning and integration test	9/2/24	1/3/25	90	Yes	Yes
software and firmware	2/3/25	4/25/25	60	No	No

Tasks

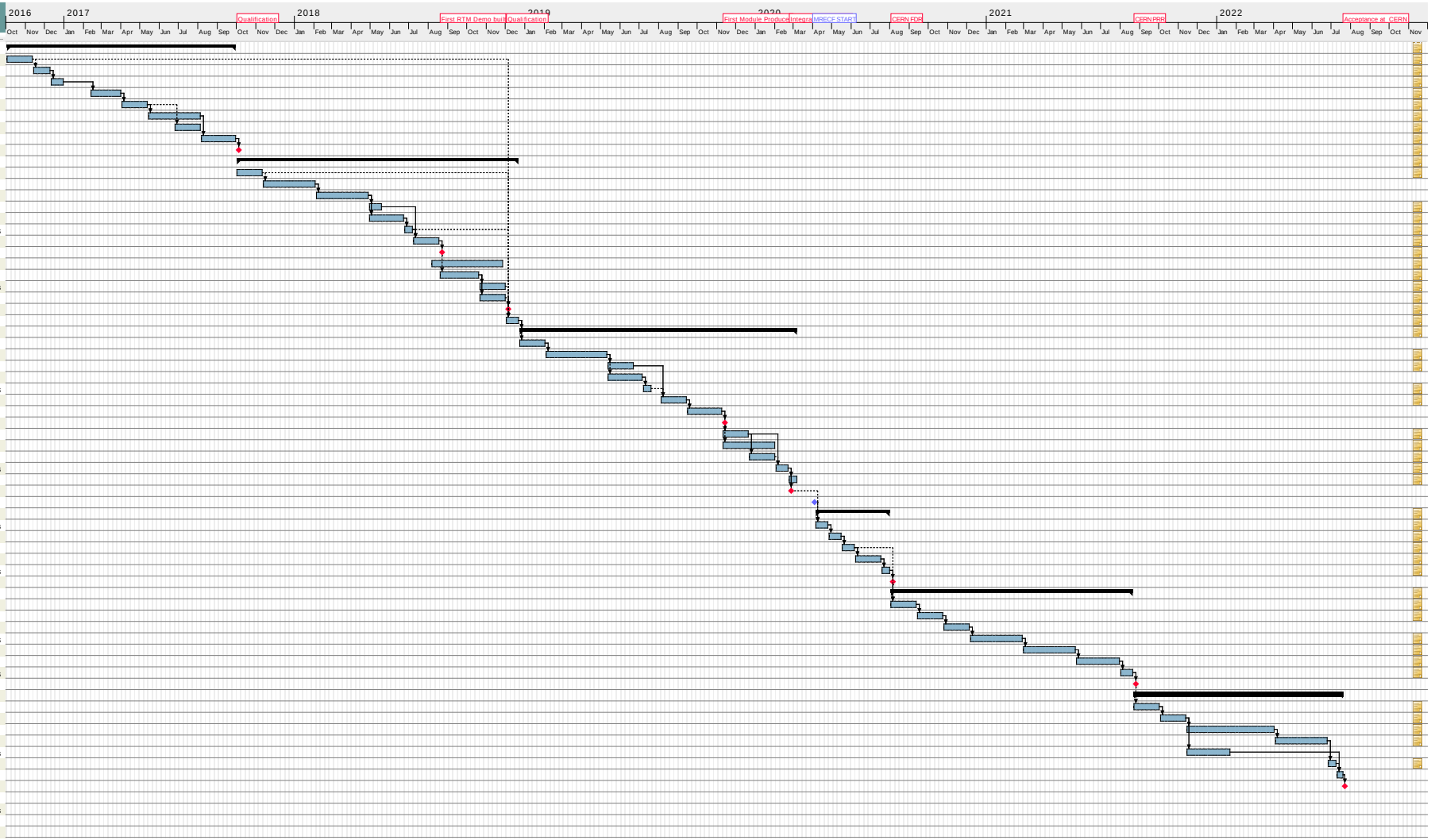
Name	Begin date	End date	Duration	Material	Travel
LHC LS3	1/1/24	1/6/26	527		

Resources

Name	Default role
Seyedali Moayedi	developer

Gantt Chart

Name	Begin date	End date	Du...	Mat...	Tr...
ual TDAQi demonstration	10/3/16	9/29/17	260		
Draft of the System Re...	10/3/16	11/11/16	30	No	No
Design of test setup	11/14/16	12/9/16	20	No	No
Hardware selection an...	12/12/16	12/30/16	15	Yes	No
Demonstrator Setup	2/13/17	3/31/17	35	No	No
PPR Link firmware	4/3/17	5/12/17	30	No	No
Trigger Link firmware	5/15/17	8/4/17	60	No	No
Trigger primitives firm...	6/26/17	8/4/17	30	No	No
System Test	8/7/17	9/29/17	40	No	No
Qualification	10/2/17	10/2/17	0	No	No
TDAQi RTM Demonstrator ...	10/2/17	12/21/18	320		
RTM high level design	10/2/17	11/10/17	30	No	No
Schematics	11/13/17	2/2/18	60	No	No
PCB Layout design	2/5/18	4/27/18	60	No	No
Component selection a...	4/30/18	5/18/18	15	Yes	No
Signal integrity Simulatio	4/30/18	6/22/18	40	No	No
Internal Design Revision	6/25/18	7/6/18	10	No	Yes
Production of RTM De...	7/9/18	8/17/18	30	Yes	No
First RTM Demo built	8/20/18	8/20/18	0	No	No
Firmware revision	8/7/18	11/26/18	80	No	No
RTM Demonstrator tes...	8/20/18	10/19/18	45	Yes	No
Integration Test @ CERN	10/22/18	11/30/18	30	Yes	Yes
Revision/production of ...	10/22/18	11/30/18	30	Yes	No
Qualification	12/3/18	12/3/18	0	No	No
Documentation	12/3/18	12/21/18	15	No	No
TDAQi Prototype	12/24/18	3/6/20	315		
Schematics	12/24/18	2/1/19	30	No	No
PCB Layout design	2/4/19	5/10/19	70	No	No
Component selection a...	5/13/19	6/21/19	30	Yes	No
Signal integrity Simulatio	5/13/19	7/5/19	40	No	No
Internal Design Revision	7/8/19	7/19/19	10	No	Yes
Production of TDAQi P...	8/5/19	9/13/19	30	Yes	No
Firmware tuning and o...	9/16/19	11/8/19	40	No	No
First Module Produced	11/11/19	11/11/19	0		
Testing of the module	11/11/19	12/20/19	30	Yes	No
Software	11/11/19	1/31/20	60	No	No
Production of V2 Proto...	12/23/19	1/31/20	30	Yes	No
Integration Test @ CERN	2/3/20	2/21/20	15	No	Yes
Documentation	2/24/20	3/6/20	10	No	No
Integration achived	2/24/20	2/24/20	0		
MRECF START	4/1/20	4/1/20	0		
TDAQi Final Design	4/6/20	7/31/20	85		
Revision of prototype	4/6/20	4/24/20	15	No	Yes
Schematics	4/27/20	5/15/20	15	No	No
Component selection ...	5/18/20	6/5/20	15	Yes	No
PCB design and simula...	6/8/20	7/17/20	30	No	No
Final Design Review @ ...	7/20/20	7/31/20	10	No	Yes
CERN FDR	8/3/20	8/3/20	0		
TDAQi preproduction	8/3/20	8/20/21	275		
Production	8/3/20	9/11/20	30	Yes	No
Qualification	9/14/20	10/23/20	30	No	No
Firmware design, testi...	10/26/20	12/4/20	30	No	No
Design of test stand	12/7/20	2/26/21	60	No	Yes
Construction of test sta...	3/1/21	5/21/21	60	Yes	No
Development of Contro...	5/24/21	7/30/21	50	No	No
Production Readiness ...	8/2/21	8/20/21	15	No	Yes
CERN PRR	8/23/21	8/23/21	0		
TDAQi production	8/23/21	7/19/22	237		
Fabrication of PCB	8/23/21	10/1/21	30	Yes	No
Mounting of components	10/4/21	11/12/21	30	Yes	No
Burn in, Acceptance Te...	11/15/21	4/1/22	100	No	No
Repairs of faulty units	4/4/22	6/24/22	60	No	No
Firmware finalisation	11/15/21	1/21/22	50	No	Yes
Shipment to CERN	6/27/22	7/8/22	10	Yes	No
Integration test at CE...	7/11/22	7/19/22	7	Yes	No
Acceptance at CERN	7/20/22	7/20/22	0		
TDAQi installation	9/2/24	4/25/25	170		
commissioning and int...	9/2/24	1/3/25	90	Yes	Yes
software and firmware	2/3/25	4/25/25	60	No	No
LHC LS3	1/1/24	1/6/26	527		



Resources Chart